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ABSTRACT

Metalinguistic skill is the ability to assume an objective attitude toward language. Metalinguistic awareness is less easily acquired and appears later developmentally than speaking and listening skills. What one needs to know to perceive and use language is not necessarily the same thing that one needs to know to reflect on and comment on language. Empirical studies have disclosed individual variation in metalinguistic functioning even among adolescents and adults whose overall language competence appears to be quite similar. Nineteen fourth grade students were interviewed in a study that explored metalinguistic awareness and its variation in upper elementary school children. In addition to the interview, each child completed a self-report instrument to gauge reading ability and attitudes toward reading and language-related activities. Children's judgments were examined by means of four tasks--language objectivity, grammaticality, illicit conjunction and comparison, and ambiguity. Preliminary inspection of the data revealed that children in the same grade, of approximately the same age, and in the same classroom show a wide range of performance on these metalinguistic tasks. (HOD)

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Linguistic Judgments and Range of Metalinguistic Awareness of Fourth Graders

Paper presented at International Reading Association Convention, New Orleans, LA
April 29, 1981

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Consider the following situations. A three year old comments that the word she is singing is not lips by adamantly declaring, "I'm saying list. It ends with a "t", not lips. Don't you hear the "tuh"? Seven year olds converse in fluent Pig Latin on the playground. In a third grade English lesson, the children can correct deviant sentences in their workbooks. Ten year olds tell and appreciate jokes that turn on linguistic ambiguity. The eleventh grader is aware of and can interpret the puns in a Shakespearian play. For some adults working the crossword puzzle in the Sunday New York Times is a favored form of diversion. What all the above have in common is that they are examples of metalinguistic awareness. Metalinguistic skill refers to the ability to assume an objective attitude toward language. (Ryan, 1980; Osherson & Markman, 1975; Cazden, 1974; Papandropoulou & Sinclair, 1974)

Although metalinguistic abilities generally develop and expand as children get older, empirical studies have disclosed individual variation in metalinguistic functioning even among adolescents and adults whose overall language competence appears to be quite similar. (Muus & Hoag, 1980; Fischer, 1980; Hirsh-Pasek, et al., 1978; Brause, 1977; Gleitman & Gleitman, 1979; Shultz & Pilon, 1973; Gleitman, et al., 1972) Under normal conditions, speaking and listening are not subject to as serious individual variation. Metalinguistic tasks appear to place additional cognitive demands on the language user. Metalinguistic awareness is thus less easily and less universally acquired and appears later developmentally than speaking andlistening. What one needs to know to perceive and use language is not necessarily the same thing that one needs to know to reflect on and comment on language.

Studying metalinguistic awareness is of interest because it adds another dimension to the description of children's (and indeed adults' as well) language abilities. Its relationship to learning to read is of particular interest. Like metalinguistic functioning, the acquisition of reading skill is subject to greater individual variation than the language skills necessary for adequate

spoken communication. Children whose productive and receptive language skills are not apparently different may not be equally adept at learning to read.

In fact, evidence in the literature suggests a direct relationship between metalinguistic awareness and reading. For beginning reading, it is awareness of sounds and words that is important. When reading materials increase substantially in vocabulary and complexity by fourth grade, the requirements and demands change. At this point higher order language analysis skills are implicated. Paula Menyuk (1981) suggests that the problems encountered by some children at this stage occur when structures found in the reading material are as yet unfamiliar to them and they thus cannot bring the structures to conscious awareness in order to comprehend. To read efficiently, a child must focus not only on the phonological aspects of the written display but also on structural and semantic cues. Children must make explicit use of their language knowledge and shift attention as the task demands. Accordingly the metalinguistic demands are likely to shift from phonological awareness to semantic and syntactic awareness. This high degree of self-conscious reflection and flexibility needed for skilled reading may be a problem for the less metalinguistically mature individual. The form of the relationship between metalinguistic skill and reading is probably not as simple as cause and effect. Learning to read may require a certain degree of metalinguistic skill while at the same time reading itself may encourage such language awareness.

The question of what the metalinguistic abilities of the older child are, especially levels of semantic and syntactic awareness, has not been thoroughly explored. Whereas there has been much research on language acquisition and development, there are fewer and less comprehensive studies of the capacity to think about language distinct from the ability to use and comprehend language. With the exception of Menyuk's (1981) work, studies addressing this issue have focused on specific aspects of metalinguistic awareness (e.g. judgments of grammaticality and ambiguity). In an effort to broaden this base, I have explored metalinguistic awareness and its variation in upper elementary school children.

I have developed an interview to assess metalinguistic skill along a variety of tasks. Traditionally, generative-transformational linguistics has utilized speaker's judgments and intuitions of grammaticality, synonymy, and ambiguity. (Smith & Wilson, 1979) These tap similar types of awareness, are relatively late in developing, and should thus show variability across subjects. I examined children's judgments in these areas by means of four tasks.

Although I worked from a predetermined list of questions and sentences, the interview is also open-ended. Probes are essential in eliciting language judgments and in determining how children handle metalinguistic tasks.

Nineteen fourth graders, nine girls and ten boys, from a middle class community outside Boston participated in the study. The mean age was 10 years with a range from 9;6 to 10;8. All the children were in the same homeroom. I saw each child individually in two sessions for a total of 45 minutes to one hour. the four tasks and the items on each separate part were presented in the same order for all the children. All interviews were audiotaped. In addition to the interview, each child completed a questionnaire designed as a self-report on reading ability and attitudes toware reading and language related activities. The teacher rated the children on reading ability, overall verbal facility, and intelligence.

Formal analysis of the data is still underway. Thus findings are informal and descriptive in nature and based on preliminary inspection and impressions of the data. As one would expect, a range of performance within tasks requiring conscious reflection on language has been revealed.

Language Objectivity Task

Pilot testing indicated the need for a warm-up task--something to help the children "get into" thinking about language. A language objectivity task employed by Osherson and Markman (1975) was adapted for this purpose.

The language objectivity task has three distinct parts.

1. Meaning and Reference. The child is asked to tell what the word elephant means and then to imagine that there are no more elephants. The referent for the

word no longer exists in reality. The child is questioned about the word's meaning now. This part addresses the question: Does the child recognize that the word has meaning even after the referent is gone? To be correct, answers must indicate that the word continues to have meaning, indeed the same meaning, even after the annihilation of the referent. By and large, all the children were successful with this part.

2. Arbitrariness of Language: The child is asked if we can call the sun the moon and the moon the sun. Once it is agreed upon, the child is asked what the thing in the sky is called when they go to bed and to describe the sky. A similar procedure is followed for cat and dog. Children are asked to give the new name of the pictured animals and to give the sounds they make. The purpose of the test is to see if children understand that the word is an arbitrary label and that the properties of the referent do not reside in the label.

The modal error on this section was to correctly rename the object in question but to attribute the properties of the new label to the object. Some children even refused to allow the names to be changed. For example:

Greg: "No you can't call the sun the moon because the sun glows and the moon doesn't. The sun means day. The moon means night." When forced he accepts the switch and responds that the thing in the sky at night will be called the sun and the sky will be bright."

Christine: "No, you can't call a dog cat. Cats have longer tails and purr. Dogs bark. Dogs chase cats, not cats chasing dogs." When shown a picture of a cat, after finally agreeing to change the names, she correctly names the animal "dog" but then says it would say "ruff".

About 1/3 of the children show this type of performance.

On the other hand, 2/3 of the children have absolutely no problem separating the label from the properties of the object to which it refers.

Michelle: "You could change the names if you told everyone, like in school." Shown a picture of a dog, "It's called cat but it still barks because we only changed names."

3. Nonphysical Nature of Words: The child is asked four questions like, "Is the word nickel worth five pennies?" This part also assesses the child's ability to separate the arbitrary label from the physical properties to which it refers. On this part, the error is to respond yes to the questions. Nearly 1/2 (9) of the

children incorrectly answer three or four of these questions. The one item correctly answered is always, "Can you buy bubble gum with the word penny?" Twenty-two percent or 4 of the children were confused and answered some yes and some no. For thirty-one percent or 6 of the children the problem was crystal clear. For example,

> Michelle: In response to "Is the word bird made of feathers?" "No, but the actual thing is."

As noted, all the children were successful with the first part of this task. Success on the second part, Arbitrariness of Language, appears to be a necessary, though not sufficient condition for success on the third part, Nonphysical Nature of Words. All of those who correctly answered all four questions on the third part, also succeeded on the second section. However, six children successful with the Arbitrariness of Language part either incorrectly answered the questions on the third part or showed confusion. Those who did not succeed on the Arbitrariness of Language section, also did not succeed on the Nonphysical Nature of Words task.

Grammaticality Task

Research has indicated children's varying sensitivity to semantics and syntax with the ability to make judgments based on syntactic cues coming later developmentally. (Hirsh-Pasek et al., 1978) The interview is comprised of four types of sentences to assess awareness on both dimensions.

1. Fully grammatical sentences (e.g. Four people were at the school.) which are syntactically correct and sematically plausible and acceptable.
2. Syntactically deviant sentences (e.g. Bill talked with and John Mary.)
3. Implausible sentences (e.g. The pencil weighs five pounds.) These are syntactically correct but the meaning encoded is implausible or unlikely by virtue of a property of the world not because of a linguistic feature of the sentences.
4. Semantically anomalous sentences (e.g. The rock is angry.) These are syntactically well-formed but violate selection restrictions in English. Part of one's knowledge of language is an awareness that there are constraints among some words which do not permit their co-occurrence. These sentences are semantically deviant by virtue of a property of language. Unlike implausible sentences which have unlikely meanings and may be logically false assertions, anomalous sentances are nonsense with no logical truth value.

Sentences of the four types were randomly ordered and read one-by-one to elicit children's judgments. I asked children to decide if a sentence was an okay sentence in English or not. I told the students I was looking for their opinions and they readily provided them as true linguistic informants. For sentences judged not okay, children were to explain what was the matter or to correct them. Once a response pattern was established, probes became sporadic to shorten the task and lessen the tedium.

Four levels of performances can be described which characterize both the maturity of the judgments and the reasoning behind such judgments. Only one of the children's performances was difficult to classify according to this scheme. Although these levels cannot be defined as a developmental sequence, the four types do reflect, in my view, varying levels of maturity in judgment giving.

Nearly all sentences like "Four people were at the school.' and 'Bill talked with and John Mary.' were judged correctly by the children. The manner in which children handle the implausible and anomalous sentences differentiates the performance levels. Responses are rarely 100% categorical. That is, there are some individual or idiosyncratic responses for most children. For example, for some children 'The purple dolphin whistled the Star Spangled Banner.' is semantically anomalous. Dolphins and whistle can't co-occur. For others, and for the adults I informally questioned, it is merely unlikely but not anomalous. Basically the question is: Are the children responding to truth, probability and meaning in judging sentences or are they judging sentences based on form or properties of the language?

Level 1: This is both the modal and least mature performance. Eight (42%) of the children are at this level. The children do not assume an objective attitude in judging sentences. They reject both implausible and anomalous sentences. The main criterion for judging a sentence is the child's interpretation of the meaning or reality to which the sentence refers rather than the form of the sentence. The children are very sure of their judgments. At this level, they do not uniformly differentiate between implausible and anomalous sentences. Their

responses to both types are similar.

The pencil weighs five pounds.	"Not true. You wouldn't be able to pick it up."
The secret is purple.	"Not okay because everyone knows purple."
Love is near the school.	"Not okay, I don't really like school."

Only this group makes a number of errors even on fully grammatical and syntactically deviant sentences.

Green is the nicest color.	"Not okay because some people don't like green."

Slightly syntactically deviant sentences like,

I am owing you five cents.
There live four people in that house.
You were late this morning, aren't you?

are accepted by some. Perhaps because the meaning is clear they are unaware of or overlook the deviance.

These responses and the rejection of implausible and anomalous sentences highlight the children's reliance on meaning and plausibility in making judgments of grammaticality.

Level 2: Five children (26%) are at this level. Anomalous sentences are still completely rejected. The explanations, however, tend to be in general terms indicating the anomaly and differentiating them from the implausible sentences.

Love is near the school.	"Not good because love is not a thing."
	"Okay if it means someone named Love, but not otherwise."
The rock is angry.	"Not okay, rocks, don't have emotions."

Judgments of the implausible sentences show a transitional type of performance. These sentences cause some confusion with some being accepted and some rejected.

The 1st grader is 8 feet tall.	"Could be a sentence, but they're not 8 feet."
	"Could happen, no it couldn't."
I saw a purple cow with green velvet eyes.	"Not okay, but could be a sentence--but cows don't have green velvet eyes."
	"No such thing, but I guess you could paint it

Meaning and structure are in conflict. This is different than Level 1 where there is no conflict. Children at this level actively search for some way to justify a sentence as plausible indicating implicit recognition that the structure is acceptable. But the structure alone is not enough to elicit a judgment of acceptability. Meaning is still the deciding factor. The conflict is illustrated by a comment by a girl the day after doing this task, "You know those sentences that are no such thing. I thought about it and I think they are all sentences."

Level 3: This level is characterized by the child being able to consider sentence structure in conjunction with meaning in making judgments. Three children (16%) are at this level. Anomalous sentences are still rejected but the implausible sentences are now under control. They are uniformly accepted and the confusion apparent at Level 2 has cleared. The children recognize the implausible sentences as somewhat strange in meaning but are able to deal with them objectively.

The baby read the book.	"Babies don't read, but the sentence is okay."
	"Okay sentence, but they don't really read, they look at the pictures."
The man bit the dog.	"Okay sentence, but could they do it?"

These children evidently know a great deal about their language and can stand back and look at language rather through it.

Level 4: Language objectivity goes one step further with this type of performance. Two of the children (10%) are at this level. The structural acceptability of a sentence is the most salient criterion in making judgments of grammaticality. The meaning of the sentence is a secondary consideration. When form and meaning are in conflict, form is the basis of the judgment. Thus they accept the anomalous sentences as legitimate sentences on the basis of form while noting their semantic deviance.

The door ran across the room.	"It is a sentence, but it couldn't happen."
Multiplication problems drink coca cola.	"Problems are just numbers written on paper. But it's a sentence."
	"On what planet? But okay sentence."
The secret is purple.	"How can a secret be purple? As a sentence good, but the meaning is funny."
The story is skinny.	"It's a sentence but with funny words. A story is short, a book is skinny."

I had not anticipated such an objective attitude in making judgments of grammaticality. For these children, sentences should make sense, but more importantly, they must conform to the structural patterns of English.

Illicit Conjunction and Comparison

The third task is to distinguish permitted combinations from illicit ones. We can say, 'Mary bought a house.' and 'Mary bought a car.' and 'Mary bought a house and a car.' is a permitted conjunction. But, whereas we can say, 'Mary caught the measles.' and 'Mary caught the ball.', we cannot combine them to 'Mary caught the measles and the ball.' This is illicit. Similarly, for comparisons, we can say, 'The carpenter is tall.' and 'The policeman is tall.' 'The carpenter is taller than the policeman.' is a permitted comparison. But, whereas we can say, 'The math assignment is hard.' and 'The rock is hard.', we cannot combine them into 'The math assignment is harder than the rock.'

Children were given 21 sentences like these--15 illicit ones and 6 permitted ones. They were asked whether or not they were okay sentences and to explain what was wrong with those judged not okay.

Virtually all the children accepted the permitted combinations. There was variation in how many items were correctly identified as not permitted from all 15 to only 7 of the items. This range is somewhat misleading, however, since 13 of the children correctly identified as wrong 12 or more of the items. What did separate the children was the adequacy or sophistication of their explanations of what is wrong with the sentences. Some children spontaneously offer fully correct and sophisticated explanations. For example, for 'Emily played the piano with

skill and Harry.' one child responded, "It's not okay. Harry is not a skill or something. Can say Emily and Harry played the piano with skill instead." Others make a stab at an explanation and may be on the right track but are not precise or explicit or need to be directly probed to answer correctly. For the same sentence, one child answered, "It's not okay because it doesn't go together." Other children recognize the sentence as not okay but either cannot explain why or offer an incorrect explanation. For example, "Not okay, it doesn't make sense." Thus, it is not just the number of sentences identified as not okay that distinguish the performances. The manner or adequacy with which the children explain the problem is also of importance.

Glen had the best performance. He identified all 15 sentences, for 13 provided fully sophisticated explanations, and came close on the other two. He had an almost perfect understanding of what was wrong with the sentences and was able to explain the problem quite precisely. Four other children performed almost as well as Glen.

Lisa had an average performance. Slightly more than half of the group showed performances between Glen's and Lisa's. She identified 14 of the sentences as wrong but gave fully adequate explanations in only 4 of the cases. For the rest of the sentences her explanations were slightly "off" or imprecise or she could only offer a vague explanation.

Christine's performance was the lowest. The remaining half of the class fell between Lisa's and Christine's performances. Christine only identified 7 of the sentences as incorrect. For these, she only gave one completely spphisticated response. The rest were imprecisely or incorrectly explained.

Ambiguity Task

Children's ability to detect and explain linguistic ambiguities in sentences and jokes has been studied by other investigators. (Muus & Hoag, 1980; Keil, in press; Hirsh-Pasek, et al., 1978; Fowles & Glanz, 1977; Brodzinsky, 1977; Brodzinsky, et al., 1977; Shultz & Horibe, 1974; Shultz & Pilon, 1973) Three types of ambiguity are usually included. With lexical ambiguities one word in the sentence has two

meanings. For example, 'The glasses are dirty.' where the word glasses means eyeglasses or drinking glasses. With surface structure ambiguity, the words in the sentence can be grouped in two different ways, each grouping resulting in a different interpretation. For example, 'They fed her dog/ biscuits.' or 'They fed her/ dog biscuits.' Deep structure ambiguities cannot be grouped differently to resolve the ambiguity. The two meanings result only from the differing grammatical relations among the words. For example, 'The shooting of the hunters was terrible.' can mean the hunters being shot by someone else or the hunters(') shooting (either their marksmanship or the fact that they are shooting) is terrible.

I read sentences of the three types to the children. The sentences were on cards so that the children could look at them if they desired. Detection of the two meanings of lexical ambiguities has been found to be easier or more accessible than the two types of structural ambiguities. Inspection of the data for these children appears to confirm this finding. The evidence is divided as to whether there is a difference between detection of the meanings for the structural types. Some have found no difference, some have found surface structure ambiguities to be more difficult, and others have found deep structure ambiguities to be more difficult. Inspection of my data suggests that surface structure ambiguities are easier than the deep structure ambiguities. In fact, the difference between the ability to detect the meanings of the lexical and surface structure items appears to be smaller than the difference between the two structural types. In other words, detection of deep structure ambiguity seems considerably more difficult than the other two.

I originally was interested in the children's ability to distinguish between ambiguous and unambiguous sentences. This task proved to be tedious and unreliable. The children were reluctant to stop searching for two meanings of the sentences. Some children would report that a sentence was ambiguous and then could not report the two meanings. I therefore changed the task by presenting twenty ambiguous sentences and informing the children at the outset that all of them had two meanings. The task was to report the two meanings and the nature of the ambiguity. (i.e. Is a sentence ambiguous because of a word or the sentence structure?)

Twenty-eight sentences, which includes eight from the first part, are included in the analysis.

There was variation in the ability to report the two meanings of given sentences. Basically responses to individual sentences can be characterized in one of three ways. 1) The two meanings are clearly accessible. 2) The two meanings are reported only with direct probing. 3) The two meanings are not reported, or are incorrectly reported even with probing. For example,

They are washing machines.

"Washing machines for clothes or they are washing IBM machines."

"Machines to wash clothes." (Child probed and alternate intonation given.) "Oh yeah some people are washing machines."

"Washing machines, there's only one."

One item was excluded because none of the children were able to clearly report both meanings. Although children varied on which sentences they missed, there were several structurally ambiguous items of both types which were missed more often than others and can thus be considered generally more difficult items. None of the lexical items appeared relatively more difficult. Further, probes were more facilitating for the lexically ambiguous sentences than for the structurally ambiguous ones. Evidently it is easier for children to be prompted to think of an alternate meaning for a word than to think of alternative relations among words. Thus for the structural items, children tended to provide the two meanings spontaneously or not at all.

Children's overall performances for correctly detecting the dual meaning of sentences ranged from 10 to 24 items. Although there is some variability among individuals, it is really not great when one considers that none of the children could detect the two meanings of all the sentences and that performances of nearly 3/4 of the children only vary by between 1 and 7 items. The relative uniformity of performances may be the result of the way the children approached the task. This task is quite demanding. The children approached each sentence as a puzzle and worked diligently to arrive at a sclution. Many of the paraphrases were remarkably creative. Note the following examples.

For 'They fed her dog biscuits.' several children offered that the dog's name was biscuits. Similarly, 'We decided the bird should be free.', a few children suggested that the bird's name could be free. The prize in this category goes to the girl who found an ambiguity where none was planned. She said, 'I saw a taller woman than Alice saw.' could have two meanings if Saw is Alice's last name.

A few answers are more original. For 'I know a shorter man than Bob.', one boy said the "short could also mean short tempered." 'The shooting of the hunters was terrible.' could mean "shooting a movie of the hunters." "Richard stopped the woman with a gun.' could be "Richard used the gun as an obstacle to stop the woman."

Performances on the Ambiguity Task tend to cluster. For the first three tasks there is a greater spread and the ability or lack of ability generally extends over the three tasks. The greater uniformity of performance on the Ambiguity Task has an interesting result. Some children who performed at lower levels on the first three tasks perform relatively better on the Ambiguity Task. For example, Christine refused to change the names of dogs and cats and indicated that the properties of the object resided in the label. She rejected the sentence 'Green is the nicest color.' because she didn't like green and was only able to correctly identify seven of the illicit combinations. Most of these explanations were incorrect. "Mary couldn't catch the measles and the ball because she'd stay inside if she had the measles and you don't play ball indoors." Yet, on the Ambiguity Task, she correctly detected the two meanings of 17 sentences, which was an average performance and provided some very sophisticated answers. For 'She had her bicycle stolen.' she answered, "She wanted someone to steal it or it was stolen without her knowing it."

Similarly, some children whose performances are among the highest on the first three tasks perform relatively less well with ambiguous sentences. Peter exhibited a perfect performance on the Language Objectivity Task, accepted implausible sentences because they are, "said right", and supplied sophisticated explanations for nearly all the illicit combinations. He explained that Mary

caught the measles and the ball was not okay because, "Measles are germs and catching a ball is doing something. You don't catch them in the same way. They don't go together." Yet on the Ambiguity Task, Peter correctly detected the ambiguities in 21 sentences, only four more than Christine.

The Ambiguity Task is different in character than the other tasks. The task requirements have changed. For the other tasks the children give judgments without any notion or concern that their answers are right or wrong. Indeed, given the task requirements and instructions--give me your opinion--there is no right or wrong answer. For the Ambiguity Task, however, there are predetermined answers to retrieve. I am no longer asking just for opinions or judgments. Perhaps the requirement of generating the two meanings for the sentences gives the children a concrete goal that they all can strive for. Thus, the performances on this task are more uniform than the performances on the other three.

In summary, preliminary inspection of the data reveals that children in the same grade, of approximately the same age, and in the same classroom evidence quite a range of performance on these metalinguistic tasks.

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Linguistic Judgments and Range of Metalinguistic Awareness of Fourth Graders

Sample Items from Metalinguistic Interview

1. Language Objectivity Task

   A. Meaning and Reference: Imagine there are no more elephants. What does the word elephant mean now?

   B. Arbitrariness of Language: Suppose everyone decided to call cats dogs and dogs cats. Can we do that? (Shown a picture of a cat/dog) Give its new name. What sound does it make?

   C. Nonphysical Nature of Words: Is the word nickel worth five pennies?

2. Grammaticality Task

   Child is asked to judge if given sentences are okay sentences.

   1. Four people were at the school. (fully grammatical)
   2. Bill talked with and John Mary. (syntactically deviant)
   3. The pencil weighs five pounds. (implausible)
   4. The rock is angry. (semantically anomalous)

3. Illicit Conjunction and Comparison

   Child is asked to judge if given sentences are okay sentences.

   1. Mary bought a house and a car. (permitted conjunction)
   2. Mary caught the measles and the ball. (illicit conjunction)
   3. The carpenter is taller than the policeman. (permitted comparison)
   4. The math assignment is harder than the rock. (illicit comparison)

4. Ambiguity Task

   The child is asked to decide if a sentence is ambiguous*, paraphrase the two meanings, and explain in his/her own words the nature of the ambiguity.

   1. The game was a tie. (unambiguous)
   2. The glasses are dirty. (lexical ambiguity)
   3. They fed her dog biscuits. (surface structure ambiguity)
   4. The shooting of the hunters was terrible. (deep structure ambiguity)

   * Only one part of the Ambiguity Task required the child to distinguish ambiguous from unambiguous sentences.